

REMARKS

This is intended as a full and complete response to the Office Action dated March 11, 2002, having a shortened statutory period for response set to expire on June 11, 2002. Please reconsider the claims pending in the application for reasons discussed below. The Applicants have amended the specification to more clearly recite the invention and aver that no new matter has been introduced. The last paragraph on page 17, lines 27 and 30 and the first paragraph on page 18, line 6 have been replaced. Claims 65-72 have been added herein.

Claims 46-64 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 53 and similar claims of copending Application No. 09/161,970. The Applicants acknowledge the Examiner's request for a terminal disclaimer for provisional obvious-type double patenting rejection. A terminal disclaimer shall be filed in response to allowable subject matter.

Claims 46-64 stand rejected under 35 U.S.C. 112, first paragraph. The Examiner states that it is not understood from the base claims 46 and 54 what the pod loader is comprised of, how it structurally functions, and where it is structurally located with respect to the other claim elements. The Examiner further states that it is not understood what the mini-environment is structurally comprised of and its location. The Applicants have amended the claims to more clearly recite the invention. The Applicants submit that the changes made herein do not introduce new subject matter and are fully supported by the specification.

Claims 46-64 stand rejected under 35 U.S.C. 112, second paragraph. The Applicants have amended the claims to more clearly recite the invention. The Applicants submit that the changes made herein do not introduce new subject matter and are fully supported by the specification.

Regarding base claims 46 and 54, the Examiner asserts that it is not understood what the pod loader is comprised of, is the pressure therein atmospheric, reduced, or what?

As amended, claim 46 and 54 recite a mini-environment coupled to a wafer cassette, a robot disposed within the mini-environment, one or more load lock chambers connected to the mini-environment, and one or more process chambers connected to the one or more load lock chambers, wherein each load lock chamber is connected to a single process chamber. The term "pod loader" is no longer included; thus, Applicants submit that the pod loader issue is moot. In light of the amendment, withdrawal of the rejection is respectfully requested.

With regard to base claim 56, the Examiner states that no robot structure in the mini-environment and no transfer robot structure in the load lock have been set forth. Further, the Examiner asserts that no gate means has been set forth between the load lock and process chamber, also no structure has been set forth to define the process chamber.

As amended, claim 56 recites a robot disposed within the mini-environment and a transfer robot disposed in each load lock chamber. The mini-environment robot is shown in Figures 12 and 13, and identified at page 17, line 17 to page 18, line 12. The transfer robot is described at page 7, lines 29 to page 9, line 27 and shown in Figures 2 and 3. With regard to the gate means, the specification in at least page 2, lines 15-16 and Figure 2 discloses the chamber wall 210 having an aperture 248 defined therein to enable horizontal wafer transfer along a transfer plane B into an attached process chamber 249. Additionally, the specification discloses an embodiment of an elongated substantially rectangular aperture in at least Figure 2. In at least page 16, lines 22-25 the specification clearly discloses a sealing means such as a gate valve. Therefore, each element is provided by this disclosure. In accordance with MPEP § 2373.02, Applicants submit that one of ordinary skill in the art would know how to interpret the claim elements' structure and correlation in light of the content of the disclosure. In light of the Applicants' amendments and discussion, withdrawal of the rejection is respectfully requested.

Regarding claims 47 and 56, the Examiner asserts improper alternative claiming with regard to the load lock and process chambers and does not understand the function of the lid.

The Applicants respectfully traverse the rejection. The Applicants are not clear as to why the Examiner asserts improper alternative claiming with regard to the load lock and process chambers as each element is properly set forth. However, assuming that the rejection is based on the recitation in each claim of "one or more load lock chambers", each claim has been amended to substitute "each" for "the". This is believed to overcome the rejection. With regard to claim 47, the load lock chamber includes an enclosure having a bottom, a lid and sidewalls that define a chamber cavity, and a transfer robot disposed in each load lock chamber adjacent the bottom and the lid. With regard to the functioning of the lid, the specification on at least page 6, lines 22-24 clearly discloses a vertically movable lid 216 having a second seating surface 218 adapted to substantially cover the aperture 212 and form a seal with a first sealing surface 214. Therefore, each element is provided by this disclosure. Withdrawal of the rejection is respectfully requested.

With regard to claim 49, the Examiner states that it is not clear what the term "linear configuration" is referring to.

The Applicants respectfully traverse the rejection. Claim 49 recites that each load lock chamber is connected to the single process chamber in a linear configuration. The specification discloses beginning on at least page 17, line 29 through page 18, line 13, examples of system configurations further shown in Figure 13. Page 18, lines 11-13 and Figure 13 disclose a linear system configuration 700 and an atmospheric robot 702, traveling along a track 704 that requires two degrees of freedom, X- θ . Therefore, each element is provided by this disclosure. Withdrawal of the rejection is respectfully requested.

With regard to claims 51 and 59, the Examiner states that it is not understood how a cover can define an opening, when a cover, by definition, covers an opening.

The Applicants have amended the claims to more clearly recite aspects of the invention including a cover having an opening that is covered by a lid, as recited in claims 51 and 59, and aver that the rejection of these claims is now moot.

With regard to claim 60, the Examiner states that it is not understood what the transfer assembly structurally comprises.

The Applicants respectfully traverse the rejection. The specification provides a description of the transfer assembly. The specification discloses beginning on at least page 11, line 15, through page 12, line 29, embodiments of the transfer assembly. Page 11, lines 16-19 disclose the transfer assembly includes a first pair of cooperating lift forks 420 coupled to a first Z-θ actuating assembly 460 (shown in Figures 6 and 9) and second pair of cooperating lift forks 422 coupled to a second Z-θ actuating assembly 462 (shown in Figure 6). Therefore, each element is provided by this disclosure. In accordance with MPEP § 2373.02, Applicants submit that one of ordinary skill in the art would know how the transfer assembly may be used in light of the content of the disclosure. Withdrawal of the rejection is respectfully requested.

With regard to claims 55-57, the Examiner states that it is not understood where the aperture is structurally located and its function.

The Applicants respectfully traverse the rejection. Claim 55 recites the load lock chamber further comprises an elongated substantially rectangular aperture, and a hermetic sealing apparatus adapted to substantially cover the aperture. Claim 57 recites wherein the load lock chamber further comprises a substantially rectangular aperture for providing fluid communication between the load lock chamber and the process chamber. The structural location and function of the aperture are described in the specification at least on page 7, lines 15-27, page 9, line 12, page 9 line 28, page 16 lines 14-24, and at least Figure 3. Page 6, lines 19-20 disclose the chamber wall 210 has an aperture 248 defined therein to enable horizontal wafer transfer along a transfer plane B into an attached process chamber 249. The aperture 248 is selectively sealed by a sealing apparatus 252, such as a slit valve, disposed through the bottom 208 of the load lock 200. Therefore, the specification describes an aperture at several places. In accordance with MPEP § 2373.02, Applicants submit that one of ordinary skill in the art would know how the aperture may be used in light of the content of the disclosure. Withdrawal of the rejection is respectfully requested.

With regard to claims 50 and 61, the Examiner states that he does not understand the function of the pins.

The Applicants respectfully traverse the rejection. Claim 50 recites one or more perforations disposed in the bottom thereof, and one or more lift pins slidably disposed

through the one or more perforations. The specification discloses, on at least page 7, lines 5-12 and Figure 2, a lifting mechanism 232 located below the load lock 200 to raise and lower a wafer from an external robot blade or other wafer supporting device. The lifting mechanism 232 includes a plurality of radially extending wafer support pins 234 slidably disposed through the bottom 208 of the load lock. Each pin 234 is supported at one end on a mounting plate 240 and terminates in an upper spherical portion. The mounting plate 240, in turn, is connected to a vertically movable shaft 244 capable of raising and lowering the mounting plate 240 and, consequently, the support pins 234. Therefore, each element of the lift pins are provided by this disclosure. In accordance with MPEP § 2373.02, Applicants submit that one of ordinary skill in the art would know how the pins may be used in light of the content of the disclosure. Withdrawal of the rejection is respectfully requested.

With regard to claims 60, the Examiner states that it is not understood the function of the transfer assembly.

The Applicants respectfully traverse the rejection. Claim 60 recites a transfer assembly adapted to transfer the substrates to a plurality of positions. The specification discloses beginning on at least page 11, line 6, through page 12, line 11, embodiments of the transfer assembly. In at least Page 9, lines 21-23, the specification clearly discloses a wafer may be vertically transferred above and below the transfer plane within the central portion of the chamber cavity 201 by the transfer assembly 232. Therefore, each element of a transfer assembly is provided by this disclosure. In accordance with MPEP § 2373.02, Applicants submit that one of ordinary skill in the art would know the function of the transfer assembly in light of the content of the disclosure. Withdrawal of the rejection is respectfully requested.

Claims 46-49, 54-60 and 63 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Maydan, et al.* (U.S. Patent No. 5,292,393) in view of *Asakawa, et al.* (U.S. Patent No. 5,934,856). The Examiner states that that *Maydan, et al.* teaches a load lock having a transfer robot therein, a pod loader, etc., connected to load lock via opening, and closed by a valve. The Examiner states that *Maydan, et al.* also teaches process chambers connected to the load lock via rectangular openings and closed by hermetic valves, vacuum content, etc. Further, the Examiner states that the load lock

has an unnumbered lid thereon that does not disclose the robot in its mini-environment as disclosed by *Asakawa, et al.* and in view of the latter. The Examiner asserts it would have been obvious to have included a robot to facilitate pod movement as taught by *Asakawa, et al.* The Examiner further asserts it would have been obvious to have conventionally formed the central portion, have conventionally formed the process chamber, and included a conventional transfer assembly.

The Applicants respectfully traverse the rejection. *Maydan, et al.* discloses a multichamber integrated process system having a pentagonal housing with sidewalls and slits therein for mounting a plurality of process chambers thereto. (See, Figure 1, Figure 20, Abstract, col. 2, lines 35-66, and col. 4, lines 18-31).

Asakawa, et al. discloses a multichamber integrated process system having a substantially polygon transfer chamber located in a center of a plurality of processing chambers with sidewalls and slits therein for mounting the plurality of process chambers thereto. *Asakawa, et al.* also discloses a load lock chamber communicating with the transfer chamber using a gate. (See Figures 1, 4, 5, 7-11, col. 3, lines 20-65).

Maydan, et al., and *Asakawa*, neither alone nor in combination, teach, show or suggest a semiconductor processing system having a plurality of load lock chambers in which each load lock chamber is connected to a single process chamber. Further, *Maydan, et al.*, and *Asakawa*, neither alone nor in combination, teach, show or suggest a mini-environment coupled to a wafer cassette, a robot disposed within the mini-environment, wherein the one or more load lock chambers are connected to the mini-environment, as defined by the claims. In addition, *Maydan, et al.*, and *Asakawa*, neither alone nor in combination, teach, show or suggest one or more process chambers connected to the one or more load lock chambers, wherein each load lock chamber is connected to a single process chamber as recited in claims 46-49, 54, and 55. Further, *Maydan, et al.*, and *Asakawa*, neither alone nor in combination, teach, show or suggest a mini-environment coupled to a wafer cassette, a robot disposed within the mini-environment, and one or more load lock chambers connected to the mini-environment. The claimed load locks are each connected to a single process chamber as recited in claims 56-60, and 63. In *Maydan, et al.*, and *Asakawa*, the substrate travels from a cassette to a load lock to a transfer chamber to a process

chamber. Aspects of the invention disclose that substrates travel through processing in a different order. Aspects of the invention disclose that substrates travel from a cassette to a mini-environment where they are then transferred to a load lock chamber and transferred directly to a processing chamber. Therefore, the Examiner's proposed combination of references does not result in the claimed invention. The Examiner has not shown that *Maydan, et al.*, or *Asakawa* alone or in combination teach, show, or suggest linking a load lock directly to a single processing chamber.

The Federal Circuit recently reemphasized that the U.S. Patent and Trademark Office bears the burden of establishing a case of *prima facie* obviousness in *In Re Dembiczak*, 50 USPQ2d 1614 (Fed. Cir. 1999). *In Re Dembiczak* requires the Examiner to particularly identify any suggestion, teaching or motivation to combine or modify references. The mere recitation by the Examiner of that it would have been obvious to one of ordinary skill in the art to include a robot to facilitate pod movement as taught by *Asakawa, et al.* and that it would have been obvious to conventionally form the central portion, the process chamber, and include a conventional transfer assembly does not amount to a teaching of the invention. Applicants respectfully request the Examiner to withdraw the rejection.

Claims 50, 51, 61 and 62 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Maydan, et al.* (U.S. Patent No. 5,292,393) in view of *Asakawa, et al.* (U.S. Patent No. 5,934,856) as applied to claims 46-49, 54-60 and 63, and further in view of *Ohtani, et al.* (U.S. Patent No. 4,923,054). The Examiner asserts it would have been obvious to substitute pin lifters as taught by *Ohtani, et al.*

The Applicants respectfully traverse the rejection. *Maydan, et al.* discloses a multichamber integrated process system having a pentagonal housing with sidewalls and slits therein for mounting a plurality of process chambers thereto. (See, Figure 1, Figure 20, Abstract, col. 2, lines 35-66, and col. 4, lines 18-31).

Asakawa, et al. discloses a multichamber integrated process system having a substantially polygon transfer chamber located in a center of a plurality of processing chambers with sidewalls and slits therein for mounting the plurality of process chambers thereto. *Asakawa, et al.* also discloses a load lock chamber communicating with the transfer chamber using a gate. (See Figures 1, 4, 5, 7-11, col. 3, lines 20-65).

Ohtani, et al. discloses apparatus for storing and transferring a wafer. The apparatus further includes a path for which the wafer can be transferred therethrough, a structure for storing the wafer, a first elevator for raising and lowering the wafer transfer position, and a second elevator for raising and lowering a wafer holder on support protrusions. (See, abstract, Figures 1-3, col. 2, lines 31-67, col. 3, lines 1-31, and lines 55-67).

While *Ohtani, et al.* discloses support protrusions and an elevator means, *Ohtani, et al.* does not supply what is also lacking in *Maydan, et al.*, and *Asakawa*, namely a load lock chamber connected to a single process chamber. Accordingly, *Maydan, et al.*, *Asakawa*, and *Ohtani, et al.* neither alone nor in combination, teach, show or suggest a semiconductor processing system having a plurality of load lock chambers in which each load lock chamber is connected to a single process chamber. *Maydan, et al.*, *Asakawa*, and *Ohtani, et al.* neither alone nor in combination, teach, show or suggest one or more load lock chambers, wherein each load lock chamber is directly connected to a single process chamber as recited in claims 50 and 51. Therefore, the Examiner's proposed addition of *Ohtani, et al.* does not result in the claimed invention. The Examiner has not established a *prima facie* showing of obviousness. Applicants respectfully request the Examiner to withdraw the rejection.

Claims 52, 53 and 64 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Maydan, et al.*, (U.S. Patent No. 5,292,393) in view of *Asakawa, et al.* (U.S. Patent No. 5,934,856) and *Ohtani, et al.* (U.S. Patent No. 4,923,054) as applied to claims 50, 51, 61 and 62 above, and further in view of *Brancher* (U.S. Patent No. 5,330,301). The Examiner asserts that if it is inferred that the lid is movable, then this is rendered obvious by *Brancher*. The Examiner further asserts that the inclusion of a conventional stabilizing rod and sealable bellows to minimize contamination would have been obvious.

The Applicants respectfully traverse the rejection. *Maydan, et al.* discloses a multichamber integrated process system having a pentagonal housing with sidewalls and slits therein for mounting a plurality of process chambers thereto. (See, Figure 1, Figure 20, Abstract, col. 2, lines 35-66, and col. 4, lines 18-31).

Asakawa, et al. discloses a multichamber integrated process system having a substantially polygon transfer chamber located in a center of a plurality of processing chambers with sidewalls and slits therein for mounting the plurality of process chambers thereto. *Asakawa, et al.* also discloses a load lock chamber communicating with the transfer chamber using a gate. (See Figures 1, 4, 5, 7-11, col. 3, lines 20-65).

Ohtani, et al. discloses apparatus for storing and transferring a wafer. The apparatus further includes a path for which the wafer can be transferred therethrough, a structure for storing the wafer, a first elevator for raising and lowering the wafer transfer position, and a second elevator for raising and lowering a wafer holder on support protrusions. (See, abstract, Figures 1-3, col. 2, lines 31-67, col. 3, lines 1-31, and lines 55-67).

Brancher discloses a batch loading mechanism having a loading chamber 26 and a pallet for supporting a plurality of work pieces on a carrier. The loading chamber is accessible through an apparently hinged lid. (See, abstract, Figures 1 and 2, col. 1, lines 64-67, col. 2, lines 1-39)

While *Brancher* discloses a lid that appears to be hinged, *Brancher* does not supply what is also lacking in *Maydan, et al.*, *Asakawa*, and *Ohtani, et al.*, namely a load lock chamber directly connected to a single process chamber. Accordingly, *Maydan, et al.*, *Asakawa*, *Ohtani, et al.*, and *Brancher*, neither alone nor in combination, teach, show or suggest a semiconductor processing system having a plurality of load lock chambers in which each load lock chamber is connected to a single process chamber. Further, *Maydan, et al.*, *Asakawa*, *Ohtani, et al.*, and *Brancher*, neither alone nor in combination, teach, show or suggest a mini-environment coupled to a wafer cassette, a robot disposed within the mini-environment, one or more load lock chambers connected to the mini-environment, and one or more process chambers connected to the one or more load lock chambers, wherein each load lock chamber is connected to a single process chamber as recited in claims 52, 53, and 64. Therefore, the Examiner's proposed combination does not result in the claimed invention. The Examiner has not established a *prima facie* showing of obviousness. Applicants respectfully request the Examiner to withdraw the rejection.

In conclusion, the references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the method or process of the invention. Having addressed all issues set out in the office action, applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

The prior art made of record is noted. However, it is believed that the secondary references are no more pertinent to the Applicants' disclosure than the primary references cited in the office action. Therefore, it is believed that a detailed discussion of the secondary references is not deemed necessary for a full and complete response to this office action. Accordingly, allowance of the claims is respectfully requested.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

On page 17, the last paragraph from lines 26-30, through page 18, line 1, and on page 18, the first paragraph, lines 2-15, should read as follows:

Figure 13 shows another configuration incorporating the present invention wherein a system configuration 700 is linear and an atmospheric robot [702] 703, traveling along a track 704 requires two degrees of freedom, X- Θ . The cassettes 606 are located on one side of the track 704 while the load locks 200 and attached process chambers 604 located on the other side. The atmospheric robot [702] 703 travels along the track 704 and communicates with the cassettes 606 and the load locks 200.

In both Figure 12 and Figure 13, the load lock environment may be maintained at atmospheric pressure. Thus, the present invention dispenses with the need for a large constant vacuum system and/or multiple intermediate vacuum stages. Further a mini-environment 704 may be defined by a wall 702. The wall 702 is shown as enclosing the atmospheric robots 602, [702] 703 and having the various components of the systems 600 and 700 attached along an exterior side of the wall 702. Figures 12 and 13 show two other configurations in which the wall is moved to encompass additional components. In a preferred embodiment, wall 702' (shown in phantom) includes the load locks 200 within a mini-environment 704' while yet another configuration, shown in Figures 12 and 13, encompasses all the components by a wall 706 such that the entire systems 600 and 700 comprise mini-environments 708. The mini-environments 704, 704', 708 maintain a clean room substantially free of contaminants. A filtration system 710 (only one shown servicing mini-environment 708) supplies a filtered inert gas, such as air, into the mini-environment 708 and vents gray air therefrom.

IN THE DRAWINGS:

Applicants propose amendment of the drawings to correct errors noted subsequent to filing the application. Applicants have submitted the proposed corrections marked in red on the attached copies of the original drawings filed in the application. The proposed corrections conform the drawings to the written description of the invention without adding new matter. Applicants will provide corrected formal drawings upon notification of allowance.

Figure 13 is amended to change the number of the robot from "702" to --703--.

IN THE CLAIMS:

Please amend the following claims:

46. (Amended) A semiconductor processing system, comprising:
[a pod loader];
a mini-environment coupled to a wafer cassette;
[having] a robot disposed [therein] within the mini-environment;
one or more load lock chambers connected to the mini-environment; and
one or more process chambers connected to the one or more load lock chambers, wherein each load lock chamber is connected to a single process chamber.
47. (Amended) The system of claim 46, wherein each load lock chamber comprises:
an enclosure having a bottom, a lid and sidewalls defining a chamber cavity; and
a transfer robot disposed in [the] each load lock chamber adjacent the bottom and the lid.
48. The system of claim 47, wherein a central portion of each chamber cavity has a diameter slightly larger than a diameter of a substrate to be received in the system.

49. The system of claim 47, wherein each load lock chamber is connected to the single process chamber in a linear configuration.
50. The system of claim 47, wherein the load lock chamber further comprises:
one or more perforations disposed in the bottom thereof; and
one or more lift pins slidably disposed through the one or more perforations.
51. (Amended) The system of claim 50, wherein the load lock chamber further comprises a cover [defining] having an opening and the lid is adapted to substantially cover the opening.
52. The system of claim 51, wherein the lid further comprises at least one stabilizing rod disposed through the lid and connected to the cover.
53. The system of claim 52, wherein the lid further comprises a bellow sleeves disposed around a lower portion the stabilizing rod.
54. The system of claim 46, further comprising a vacuum pump connected to the load lock chamber.
55. The system of claim 48, wherein the load lock chamber further comprises:
an elongated substantially rectangular aperture; and
a hermetic sealing apparatus adapted to substantially cover the aperture.
56. (Amended) A semiconductor processing system for processing substrates, comprising:
[a pod loader;]
a mini-environment coupled to a wafer cassette;
[having] a robot disposed [therein] within the mini-environment;
one or more load lock chambers connected to the mini-environment, each load lock chamber comprising:

an enclosure having a bottom, a lid and sidewalls defining a chamber cavity having a central portion having a diameter slightly larger than a diameter of the substrates to be received in the system; and

a transfer robot disposed in [the] each load lock chamber, wherein [the] each transfer robot comprises:

one or more actuators;

a linkage; and

a substrate support means; and

one or more process chambers connected to the one or more load lock chambers, wherein each load lock chamber is connected to a single process chamber.

57. The system of claim 56, wherein [the] each load lock chamber is fluidly connected to the single process chamber via [further comprises] a substantially rectangular aperture [for providing fluid communication between the load lock chamber and the process chamber].

58. The system of claim 57, wherein the load lock chamber further comprises a hermetic seal adapted to substantially cover the aperture.

59. (Amended) The system of claim 58, wherein the load lock chamber further comprises:

a cover [defining] having an opening and the lid is adapted to substantially cover the opening.

60. The system of claim 59, further comprising:

a transfer assembly adapted to transfer the substrates to a plurality of positions.

61. The system of claim 59, wherein the load lock chamber further comprises:

one or more perforations disposed in the bottom; and

one or more lift pins slidably disposed through the perforations.

62. The system of claim 61, wherein the lift pins are coupled at one end to a linear actuator.
63. The apparatus of claim 56, wherein a vacuum pump is in fluid communication with the load lock chamber.
64. The system of claim 61, wherein the lid further comprises:
at least one stabilizing rod disposed through the lid and connected to the cover;
and
a bellow sleeves disposed around a lower portion the stabilizing rod.

Please add the following new claims:

65. (New) A semiconductor processing system, comprising:
a wall defining a mini-environment fluidly coupled to a wafer cassette containing one or more wafers;
at least one robot disposed within the mini-environment and accessible to the wafer cassette via an opening in the wall;
one or more load lock chambers connected to the mini-environment, wherein the load lock chambers comprise a lid, bottom, and sidewall to define an enclosure having an inside diameter slightly larger than the a wafer to be received therein;
one or more process chambers fluidly coupled to the one or more load lock chambers, wherein each load lock chamber is connected to a single process chamber.
66. (New) The system of claim 65, a slit valve positioned between each load lock chamber and its process chamber to provide a vacuum seal therebetween.
67. (New) The system of claim 65, wherein each lid is movable in a vertical direction relative the bottom.

68. (New) The system of claim 65, wherein the robot is disposed external to the one or more load lock chambers.

69. (New) The system of claim 65, further comprising an internal robot disposed within each load lock chamber and in communication with the single process chamber coupled thereto.

70. (New) The system of claim 65, further comprising a lifting apparatus configured to shuttle substrates from the mini-environment to the one or more load lock chambers.

71. (New) A semiconductor processing system, comprising:
a mini-environment coupled to a wafer cassette;
a robot disposed within the mini-environment;
a plurality of load lock chambers connected to the mini-environment; and
a plurality of process chambers, each connected to a single load lock chamber.

72. (New) A semiconductor processing system for processing substrates, comprising:
a mini-environment coupled to a wafer cassette;
a robot disposed within the mini-environment;
a plurality of load lock chambers connected to the mini-environment, each load lock chamber comprising:
an enclosure having a bottom, a lid and sidewalls defining a chamber cavity having a central portion having a diameter slightly larger than a diameter of the substrates to be received in the system; and
a transfer robot disposed in each load lock chamber, wherein each transfer robot comprises:
one or more actuators;
a linkage;
a substrate support means; and

a plurality of process chambers connected to the plurality of load lock chambers,
each connected to a single load lock chamber.